

# Clemson IPM Program Newsletter

June 2021

Issue #3

Integrated pest management is an ecologically-based approach to managing pests with an emphasis on using multiple management strategies. The principles of IPM can be applied to any pest of food or fiber production systems, landscapes, and urban environments. IPM considers multiple control tactics with the aim of minimizing selection pressure on one given tactic.

The Clemson IPM program (<https://www.clemson.edu/extension/ipm/index.html>) seeks to increase adoption of IPM practices in South Carolina by developing interdisciplinary, research based information, and providing it to the public in efficient and accessible formats. The goals of the IPM program are driven by the needs of stakeholders, who have an integral part in developing the priorities of the current program.

The Clemson IPM Newsletter will provide updates on research, extension programs, successes in IPM, important dates, and more!



@IPM\_Clemson

Follow the Clemson IPM program on Twitter for real time updates throughout the growing season

## Meet the Team

### Pee Dee REC

Francis Reay-Jones, *Field Crop Entomology*

JC Chong, *Specialty Crop Entomology*

Joe Roberts, *Turfgrass Pathology*

Ben Powell, *Pollinator Specialist*

### Coastal REC

Tony Keinath, *Vegetable Pathology*

Matt Cutulle, *Vegetable Weeds*

Brian Ward, *Organic Vegetable*

The IPM program at Clemson is comprised of the coordination team, extension personnel, and researchers throughout the state.

### Edisto REC

Jeremy Greene, *Field Crop Entomology*

Mike Marshall, *Field Crop Weeds*

Dan Anco, *Peanut Specialist*

John Mueller, *Field Crop Pathology*

### Clemson Main Campus

Guido Schnabel, *Fruit Crop Pathology*

Juan Carlos Melgar, *Pomology*

Steve Jeffers, *Ornamental Crop and Tree Pathology*

### UGA, Athens

Brett Blaauw, *Peach Entomologist*

### Coordination Team

Francis Reay-Jones, *Program Coordinator*

Tim Bryant, *Associate Program Coordinator and Newsletter Editor*

## Tell us what you think...

Please take a few minutes to fill out this [survey](#) to tell us what you would like to see in future editions of this newsletter!

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# Helping South Carolina Growers Manage an Important Pest of Peaches

Contributing Author: **Dr. Guido Schnabel**



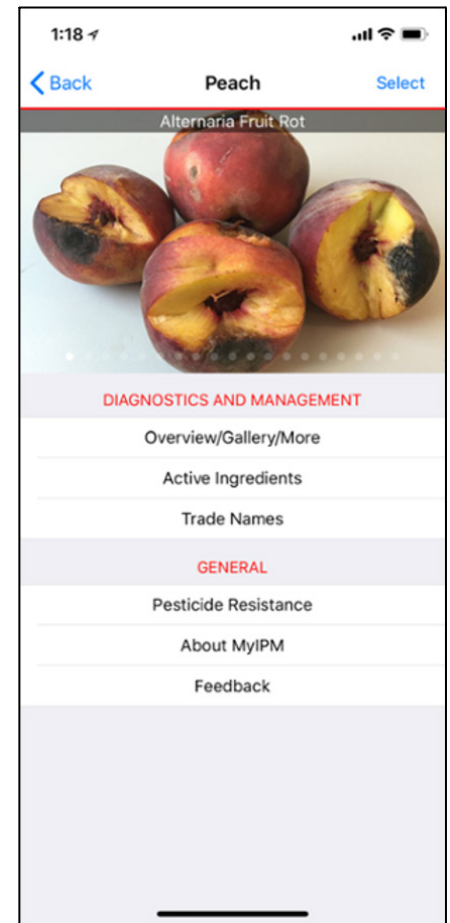
*Symptoms of brown rot on peach.*

South Carolina and Georgia are two of the leading producers of peaches in the United States. The hot and humid climate is ideal for producing high quality fruit but also supports the development and spread of fungal diseases, many of which can be economically damaging to peaches.

Of the several diseases which infect peaches, brown rot is arguably the most important in South Carolina. Under the right weather conditions, the infection cycle of brown rot starts in the spring during peach bloom when airborne spores from overwintered diseased plant material are carried to blossoms. Eventually, the entire flower can be colonized by the fungus which in turn produces infectious spores that can be spread to fruit via wind or rain splash. Infected fruit either drop to the ground or stay on the tree branch where they dry out and form a fruit mummy. These fruit mummies can in turn serve as a source of disease the next year. Under the right conditions and in the absence of effective management brown rot can be a serious concern. Dr. Guido Schnabel, a professor of

plant pathology in Clemson, SC, works on improved management of peach diseases, with brown rot being one of the most important. “There are many pathogens affecting commercial peach production in the Southeast, but only a few are driving the spray program needed to produce high quality fruit. They are *Venturia carpophila*, the causal agent of peach scab, *Xanthomonas arboricola*, the causal agent of Bacterial Spot, and *Monilinia fructicola*, the causal agent of brown rot blossom blight, green fruit rot, preharvest brown rot, and postharvest brown rot” Dr. Schnabel says.

Although cultural methods are implemented to reduce disease, the primary method of brown rot management is an effective fungicide spray program, but this is not without its challenges. “The design of effective and sustainable fungicide programs for brown rot management requires a basic understanding of the biology of the fungus, the kind of fungicides used, and knowledge of resistance management strategies” Dr. Schnabel says. One of the main concerns in an effective fungicide program,



*MyIPM app menu for management of alternaria fruit rot*

as Dr. Schnabel mentions, is managing the development of fungicide resistance.

The primary modes of fungicide resistance development are increased production or modification of the fungal enzymes targeted by the fungicides. They reduce or even eliminate the efficacy of the fungicide. Fungicides can target either a single site or multiple sites in the fungus. Using fungicides which target multiple sites reduces the risk that resistance can develop, as the fungus needs multiple mutations in different locations for resistance to develop. The generally more efficacious single-site fungicides (i.e. FRAC codes 1, 2, 3, 7, 9, 11, and 12) should be used sparingly in fungicide programs, and FRAC 1 and 2 with... (cont. on page 3)

with particular caution as resistance has already been documented in South Carolina.

Having access to fungicide information and resistance risk profiles is a critical component for growers to build an effective fungicide program. The MyIPM app is a tool that was developed by Dr. Schnabel in collaboration with the Southern IPM Center and specialists from several other universities to provide growers with this information anywhere. The app is supplemental to spray guides and provides pest and disease identification and management information. Management information includes interactive tables of fungicide active ingredients and commercial products, non-chemical control options, and

resistance management information. The app can be downloaded for free on apple or android devices [here](#).

Dr. Schnabel also recently presented on integrated management of brown rot at a webinar series from the International Society for Horticultural Science. This presentation was available for free to peach producers, and included speakers from many of the peach growing regions throughout the world discussing current issues in peach pest management. Dr. Schnabel discussed using integrated pest management for brown rot with consideration to the pest biology, fungicide sensitivity, fungicide resistance and management, host tissue susceptibility, and peach cultivars. A recording of

Dr. Schnabel's full talk in addition to the full series can be viewed [here](#).

For more detailed information on effective brown rot fungicide programs as well as a number of other important diseases of peaches, please see this [article](#) in Clemson's HGIC, [the Southeastern Peach, Nectarine, and Plum Pest Management and Culture Guide](#), or explore the [MyIPM app](#) on android or apple devices. Providing access to research-based management information through all these means allows growers to make informed decisions and implement integrated management strategies maximizing profits and minimizing environmental impacts.

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## Gray Leaf Spot Management in Turfgrass

**Contributing Author: Dr. Joe Roberts**

Dr. Joe Roberts, a turfgrass pathologist and nematologist stationed at the Pee Dee Research and Education Center, works primarily on limiting turfgrass crop loss from disease through integrated pest management. Dr. Roberts says that he has recently observed outbreaks of gray leaf spot in the Pee Dee region.

Gray leaf spot (GLS), caused by the fungus *Pyricularia grisea*, is an important pest affecting turfgrass in South Carolina and can be damaging without proper management. Symptoms of this disease first appear as water-soaked spots on leaves and progress to tan spots with a dark brown border (figure 1). When conditions are right these spots produce a large number of spores which appear gray and fuzzy

and further spread the disease via wind or water droplets. When large outbreaks of GLS occur, it can look similar to drought or heat stress areas (figure 2) so it is critical to try and identify the symptoms of disease to make proper management decisions. Grass species, irrigation levels, mowing height, and fertilizer rates all have an impact on the development and impact of GLS and should be considered in an integrated management scheme.

Both warm and cool season turfgrasses can be affected equally by GLS. Perennial ryegrass, tall fescue, fine fescue, and St. Augustine grass are all species that can be particularly susceptible. New stands of turfgrass are also more susceptible so practices that encourage proper establishment can assist in disease



*Figure 1. Symptoms of gray leaf spot on St. Augustine grass*

avoidance. Newly sodded areas are also impacted. Selecting a grass that is properly suited to the location and tolerant to disease can prevent additional costs from managing pests such as GLS. Cultivars within grass species can also vary significantly in their resistance level to GLS. (cont. on page 4)



Moisture is a critical factor that allows GLS to develop, with 14 hours of continuous leaf wetness required for the disease to develop. Monitoring irrigation levels can prevent large outbreaks and potential losses. High rates of soluble fertility during periods of drought or heat stress can also promote the development of disease.

Another important consideration in managing GLS is mowing turf to the ideal height for the species. Mowing to the proper height can reduce the overall stress on the grass and improve its natural ability to resist the development of disease as well as a number of other pests. Increased vigor of the grass can also improve the ability to manage GLS should it occur.

If all cultural control methods described above fail and an outbreak of GLS does occur, fungicides which prevent further development and spread of the disease can be

applied. Fungicides will not eliminate the damage that has already occurred, it will just prevent further development or spread of the disease. Monitoring disease activity is critical to make timely fungicide applications. The quinone outside inhibitor (QOI) class of fungicides (e.g. Compass, Fame, Heritage, and Insignia) is particularly effective for GLS. Resistance of GLS to these fungicides has been reported however, so they should be used with caution to prevent further resistance development.

Integrated pest management involves using all of the described control methods in tandem to ideally prevent the development of GLS and effectively manage it if it does develop. Under the right conditions, GLS can result in large voids in turfgrass stands. But tiven the impact of environmental conditions on disease development, IPM can go a long way to reducing turf loss from GLS. To learn more about



*Figure 2. Stand symptoms of gray leaf spot in St. Augustine grass*

managing GLS and other pests off turfgrass please see the following articles from Clemson's Home and Garden Information Center.

1. [Gray Leaf Spot on St. Augustine Grass](#)
2. [St. Augustine Grass Maintenance Calendar](#)
3. [Leaf Diseases of Lawns](#)

## Tobacco Field Day at the Pee Dee Research and Education Center

**Contributing Author: Dr. Matt Inman**

The Pee Dee Research and Education Center and Dr. Matt Inman, the Clemson tobacco extension specialist, hosted the first in-person field day since the beginning of the covid-19 pandemic on June 24. Tobacco growers, specialists, industry representatives, and extension personnel from several states attended to hear research updates and recommendations on tobacco pest management and varietal quality.

Dr. Inman discussed a wide range of trials that all contribute to mak-

ing integrated management decisions in tobacco including studies on herbicide injury to tobacco, new biological fungicides used for target spot management, different fertilizers and rates, and varietal resistance to bacterial wilt.

Bacterial wilt is one of the most significant problems in tobacco in South Carolina and it can be very difficult to manage. It first appears as wilting leaves on one side of the plant and progresses to the entire plants wilting and in most cases



*Tobacco fertilizer study*

leads to plant death. Infected stalks appear dark brown or black at ground level and have black streaks in the tissue just under the bark. The easiest way to test for bacterial wilt is to cut a stalk and place it in a clear container... (cont. on page 5)



*Dr. Matt Inman speaking to tobacco stakeholders at the 2021 tobacco field day at the Pee Dee REC*

filled with water. Infected plants will begin oozing milky strands of bacteria into the water.

Continued research on improved management of bacterial wilt relies on naturally occurring infestations in the field, which can be sporadic if crops are rotated. However, the bacterial wilt nursery on the Pee Dee REC has consistent bacterial wilt pressure year to year, making it an excellent location to test different bacterial wilt management strategies. Dr. Inman is currently assessing 48 different tobacco varieties for their bacterial wilt tolerance in this field. Results of this study will be incorporated into tobacco variety reports which allow growers to view a number of different quality and yield metrics when selecting varieties.

Weed management is also a consistent concern in any row crop, tobacco being no exception. Her-

bicide injury from post planting applications or drift from adjacent applications can be damaging in tobacco production. Dr. Inman is testing the effects of auxin herbicide drifts in simulated trials, tobacco's response to flumioxazin herbicide being applied at different timings and rates prior to planting, and post transplant applications of napropamide for their impacts on tobacco and their efficacy for weed management.

Another speaker at the field day was William Hardee, an area agronomy agent for Horry, Marion, and Dillon counties in South Carolina, who informed stakeholders about a water quality survey being conducted with regard to tobacco production. The goal is to collect 3 water samples per county and test a number of water quality metrics, namely pH and hardness, which can have a major impact on pesticide performance. Water makes



*Bacterial wilt nursery at the Pee Dee REC*

up the majority of the volume of pesticide applications and it is not often considered when formulating a pest management plan. In some cases the water used in the mixture can render a pesticide inert by the time a grower gets to the field. The results of these surveys will be used to publish a public record of water quality in tobacco growing regions of South Carolina.

Each of the trials described above will provide information that allows growers to make holistic management decisions throughout the season for a wide range of pests. This information, provided in an accessible format to tobacco producers, allows the creation and improvement of integrated pest management programs.